Technical Data Sheet

Cliente *Customer*				
Ordine Cliente *Customer Order*		**N°**		
Commessa *Job*		**N°**		**Serial N°**
Trasformatore trifase in olio *Oil three phase Transformer*		**Tipo** *Type*	TTO	-
Potenza nominale *Rated power*		A_n	150 / 200	MVA
Tensione nominale *Rated voltage*	Avvolgimento AT *HV Winding*	V_{1n}	220 ± 12 x1.25%	kV
	Avvolgimento BT1 *LV Winding*	V_{2n}	20	kV
	Avvolgimento BT2 *LV Winding*	V_{3n}	20	kV
Collegamento avvolgimenti *Windings connection*		AT ⇒ Star + N BT1 ⇒ delta BT2 ⇒ delta	YNd5d5	
Frequenza *Frequency*		f	50	Hz
Raffreddamento *Cooling type*		ONAN / ONAF		

Data *Date*	21	12	2023

Preparato *Prepared*	TEC	Scazzosi	**Approvato** *Approved*	TEC	Lombini

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Description	*UM*	*Values*
Quantity	*Nr.*	2
Manufacturer	-	Tamini Trasformatori S.r.l.
Factory		Legnano (MI – ITALY)
Type	-	Three phase oil immersed TTO
Standards	-	IEC60076
Operation mode	-	Continuous duty
Nominal rated power	*MVA*	150 / 200
Cooling	-	ONAN / ONAF
Frequency	*Hz*	50
N. of phases	*Nr.*	3
Rated HV voltage ratio at no-load	*kV*	220 ± 12 x 1,25%
Rated MV voltage ratio at no-load	*kV*	20 - 20
HV connection	-	Star + N
MV connection		delta - delta
Vector group	-	YNd5d5
Insulation levels HV / NHV side	*kV*	245 / 950 / 395
Insulation levels MV / NMV side	*kV*	24 / 125 / 50
Nominal current HV side	*A*	393.6 / 524.9
Nominal current MV side	*A*	2165.1 / 2886.8
Windings material	-	Cu
Insulation class	-	A
Insulating oil type	-	NYNAS LIBRA
Oil temperature rise	*K*	60
Windings temperature rise	*K*	65
Winding hot spot	*K*	78

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OUTDOOR ENVIRONMENTAL CONDITION		
Ambient temperature Min/Max	°C	-25 / +40
Max daily average ambient temperature	°C	30
Annual average ambient temperature	°C	20
Altitude	m a.s.l.	≤ 1000

GUARANTEED DATA		
No load losses at V_N e f_N	kW	72
Load-losses at nominal ratio and at 75°C 220/ 20-20kV	kW	572.3 @200MVA
PEI (TIER 2)		≥99.797
Short Circuit Impedance at nominal ratio and at 75°C	%	16 (IEC 60076 tolerance) @75MVA With one secondary in short-circuit
Sound pressure level at no load and at nominal frequency (ONAN @ 0.3 m)	dB(A)	≤70

PRELIMINARY OVERALL DIMENSIONS (TAD0100001778)		
Length	mm	9750 ± 50
Width	mm	6200 ± 50
Height	mm	7500 ± 50
PRELIMINARY WEIGHTS (TAD2800001561)		
Oil	kg.	70000
Transport (without oil)	kg.	175000
Total	kg.	255000

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FITTINGS AND MAIN ACCESSORIES

Bushings		
*Resin impregnated paper (**RIP**) bushings HV side type 245 kV / 1250 A* *creepage distance N.A.* *Ref. standard IEC60076*	*Nr.*	3
*Oil impregnated paper (**OIP**) bushings HVNEUTRAL side type 245 kV / 800 A* *creepage distance ≥25 mm/kV* *Ref. standard IEC60076*	*Nr.*	1
Porcelain bushings LV side type 24 kV / 4500 A creepage distance ≥25 mm/kV *Ref. standard EN 50180*	*Nr.*	3 + 3

On Load Tap Changer		
Quantity	*Nr.*	1
Manufacturer	-	MR
Type of tap changer	-	On load tap changer on side 220 kV
Number of positions	*Nr.*	25 (24 steps)
Type		VACUTAP® VM®
Model	-	VM III 650Y-245/C-14 27 3W
Drive type / model	-	TAPMOTION® ED / ED100S
Supply voltage	*V*	400 / 230

Rating plate AISI 316L	*Nr.*	1
First filling insulating oil uninhibited type according to IEC 60296		Nynas Libra
Transformer painting cycle according to ISO 12944	*Doc.*	23EN401-402 _Painting cycle_ Rev.00

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Cooling system data		
Radiators		
Manufacturer	-	Warm
Number of radiators	*Nr.*	20
Number of elements	*Nr.*	30
Elements height	*mm*	3200
Distance between collectors	*mm*	2700
Plate thickness	*mm*	1.2
Fans		
Manufacturer	-	Efaflu
Number of fans	*Nr.*	10
Blade diameter	*mm*	1000
Rated voltage	-	400V 3-phase 50Hz

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